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This paper analyzes an area of industry which generally does not have an identifiable activity labeled product management, where the very term product management has a foreign ring to it, and yet where the function of product management may be of unparalleled importance -- the companies serving the military and space market.

DISTINGUISHING CHARACTERISTICS OF THE MILITARY MARKET

A few words about the nature of the defense/space market may be helpful at the outset in view of some of its relatively unique characteristics and their impact on product management.[1] First of all, this market is not primarily influenced by simple, direct supply-demand relationships of the type that govern many commercial markets. Instead, the federal budget process determines both the magnitude and the composition of military and space purchases.

Another characteristic which distinguishes the military/space market is that it is essentially monopsonistic. By the selection of contractors, the Federal government can control the entry into and exit from the market and can determine the growth or decline of individual firms manufacturing weapon system and space equipment. Through the contract mechanism, the Government can, and does, impose its ways of doing business on the company suppliers, including specifying numerous internal operating policies and procedures.

Also, because of the nature of military requirements, price is a less important factor. The firm's previous cost experience may be more important than

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1. For greater detail, see M. L. Weidenbaum, The Military Market in the United States, Chicago, Illinois, American Marketing Association, 1963.

the price estimate--and it is an estimate because few contracts are of the firm fixed-price variety. In the defense/space market, the contractor's record of technical achievement is often a major factor in awarding a contract. Competition among prospective suppliers may be extremely keen, but it will relate primarily to the technical excellence of the proposed designs.

Furthermore, the market for military weapon and space systems is characterized by production undertaken after the order is received; production for inventory is rare. Often the buyer takes the initiative on new products, including financing the research and development.

Finally, the defense/space market has relatively simple channels of distribution. Basically the manufacturer sells and delivers to the final customer. Actually, the flow of material from industry to central governmental depots to base supply stations to the actual user is analogous to the flow from manufacturer to wholesaler to retailer and to the final customer in the private economy. Since the governmental customer handles most of the distribution, however, very limited marketing capabilities have been acquired by companies specializing in defense or space work.

THE NATURE OF MILITARY PRODUCT MANAGEMENT

With that background, let us explore some of the important aspects of military product management.[2] For companies or major segments of companies which are primarily oriented to the military market, the critical management

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2. Because the typical company in this market supplies both space and military equipment, this paper will subsequently refer to "military product management" to both cover both aspects.

decisions involve the allocation of research and development resources among alternative new products. Because of the extremely rapid rates of product innovation and product obsolescence, the continual choices critical to the existence and growth of the company relate to the composition of its future product line. So far as the current product line is concerned, its market share has long since been predetermined.

Companies operating in this market frequently snicker at the advertising claims of consumer-oriented companies proclaiming that over a fifth, or fourth, or third of their products were not on the market ten years ago (incidentally product advertising generally is not an allowable cost on defense contracts). For the typical defense company, none of its current products were being used by the customer a decade earlier. The aging, obsolescent liquid-fueled ICBM's such as General Dynamics' Atlas--which have not been made for several years--are now being replaced by the shiny new Boeing solid-fueled Minuteman. The Atlas had a factory life of less than a decade, but undoubtedly was a very profitable product.

Using Professor Rich's analysis of the composition of marketing activities, this results in allocating the bulk of the company's marketing resources to the first two items he lists under product management:

1. Product line planning--planning what products to make and what markets to serve, and
2. New product development--planning the development of new products in accordance with the needs and requirements of customers.[3]

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3. Stuart U. Rich, Notes on the Three-Fold Nature of the Marketing Job, University of Oregon, 1964.

This makes for a somewhat unusual distribution of effort within the overall marketing function. The product manager--i.e. the ICBM or space booster development manager--is a very senior engineering executive in a typical defense company; he is an important line manager and not infrequently an officer of the company.

He will normally have available to him a large group of specialists in the various technologies--propulsion, aerodynamics, structures, electronics, systems analysis, as well as preliminary designers and business and product planners. The kinds of decisions made by the product manager may include: (1) Should the company try to develop a third generation ICBM or improve the second generation model (the solid-fueled type)? (2) Should it work on a ballistic or nonballistic missile? (3) Should it aim for a modest improvement or a major jump in the technical state of the art in space boosters? That is, how does he evaluate the amount of time preference the customer is willing to pay for? Given the long lead times of military and space product development, wrong answers to these questions--i.e., developing a third generation ICBM when the customer later decides on a marginally improved second generation missile--can result in major declines in company sales, employment, and profits.

In contrast, the market management function is a very modest staff activity, often many tiers down the hierarchy and not part of the product manager's organization. The market research and planning unit usually focuses on analysis and projections of the military and space budget and of the likelihood of the funding of proposed specific weapon and space systems. It is the rare market planner who dares a direct confrontation with the product manager, witness the low turnover rates among the former and the extreme intercompany mobility of the latter.

Finally, sales management ordinarily is a very limited affair. Traditionally, the important "selling" (to the morally pure, sales to the military establishment are consummated without selling) is done by the senior engineering personnel who are actively participating in the product design, development, and management.

The formal sales effort is frequently and accurately referred to as "the coffee and donuts brigade." It will provide for the conveniences of visiting representatives of the governmental customer--meeting the airplanes, planning luncheons and dinners, obtaining football game tickets, and otherwise demonstrating its intimate awareness of the needs of the customer. Clearly, we do not have here the ideal strong, centralized marketing organization.

PRODUCT MANAGEMENT IN PRACTICE

It may be helpful to highlight the importance of the product management function in defense-oriented companies by reference to a few barely disguished examples.

Company A was one of the two or three largest aircraft manufacturers during World War II. At the end of the war, on the basis of its evaluation of the future of the military market, it decided to reduce its emphasis on product research, development, and other aspects of management of its basic product line. Within the available resources, it paid particular attention to the traditional, established parts of the market--at least those which became so during the war. In contrast, Company A devoted most of its resources to mergers, acquisitions, and other forms of what was essentially lateral or conglomerate diversification.

As a result of these decisions, Company A, unlike most of its competitors, makes no missile or space systems in this aerospace age. It also has lost its

position in the aircraft field and, to add to the in ult, its commercial diversification efforts were quite unrewarding. By all standards-- ales, employment, profits, assets--Company A has gone downhill.

Company B, in contrast, was a much smaller factor in the aircraft industry two decades ago. However, in the postwar period it devoted a major share of the attention of its product management organization to the emerging areas of the military market. Partly in consequence of thi farsightedness, this producer of aircraft, missiles, and space vehicles is now a most dominant element in its industry. Company B's sales, profits, etc., are at record highs.

Companies A and B are not a unique pair in their industry. Companies C and D are much smaller. Until recently, each concentrated on one important but relatively narrow part of the military aircraft market. Company D within the last few years has extended the scope of its product development efforts, while Company C has not to any significant extent. Without assessing the importance of the ingredient known as luck, we must report that Company C is in most serious difficulty because its current product is nearing the end of its market life, while Company D is constantly reaching new record volumes.[4]

Clearly, the market planning function is, or rather should be considered, more than a minor staff exercise. The foregoing analysis may indicate that the present allocation of resources within the marketing function of a typical defense supplier is far from optimal. Some insights into the pos ibilities for change may be obtained from an examination of future trends and developments.

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4. The changing positions in the military market of individual firms and industries are dealt with more systematically in "Impact of Military Procurement on American Industry," a chapter in J. A. Stockfisch, Planning and Forecasting in the Defense Industries, Belmont, California, Wadsworth Publishing Co., 1962, pp. 135-174.

CHALLENGES TO MILITARY MARKET MANAGEMENT

Several key challenges are now facing product management in military and space oriented companies. In the main, these challenges arise from the fundamental changes which are taking place in the customer's requirements.

The market, narrowly or traditionally defined, is rapidly shifting from growth to decline or to stagnation at best. The defense budget is currently declining and the NASA budget appears to be leveling off. Product management at the highest levels is going to be facing a series of fundamental decisions, essentially involving the question of broadening the product line or losing the dynamism and growth which generally have been characteristic of the companies supplying the military/space market.

One approach is to re-examine the scope and hence redefine the extent of the market. From this viewpoint, it is not strictly the military/space market, but the market for specialized government equipment, particularly that with a high technological content. As a matter of fact, the major defense companies are also the major NASA contractors. For example, an examination of the government procurement reports for 1963 shows that 24 of the top 25 defense contractors also appear on the list of major NASA contractors (the 25th is a shipbuilding company).[5] Also, the companies competing for the supersonic transport project being sponsored by the Federal Aviation Agency are also on the defense procurement list.

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5. U.S. Department of Defense, 100 Companies and Their Subsidiary Corporations Listed According to Net Value of Military Prime Contract Awards, Fiscal Year 1963; National Aeronautics and Space Administration, Annual Procurement Report, Fiscal Year 1963.

In recent Congressional hearings, several defense industry executives stated that there are major civilian government functions where the massive engineering competence of defense suppliers is needed and could usefully be employed. Many of the examples cited may require a bit of exploratory development prior to any significant product demand which may be forthcoming, such as sea farming, mining of the ocean floor, civilian space travel, nuclear salt water conversion systems, and disaster prediction and control.[6] Certainly, government purchases of nondefense goods and services are and likely will continue to expand far more rapidly than military requirements.

An alternative approach is, in a way, more internally oriented--to view the product base of the major defense suppliers as systems design and production. Here the focus is on other systems applications, both in the public as well as in the private sector, at the state and local government level as well as the national. This approach is based on the belief that the capabilities required for designing and producing weapon systems are transferable to the civilian economy--to designing integrated surface transportation systems, and to viewing regional development, in the United States or overseas, as a systems problem.

Both the product and systems approaches share the common problem of the lack of a current large-scale market in terms of a willing customer with ready cash. There is also what may be termed the negative demonstration effect of past diversification efforts--the demonstrated inability, at least to date, of the large specialized defense suppliers to utilize their capability in other than

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6. Cf. U.S. Senate Committee on Labor and Public Welfare, Convertibility of Space and Defense Resources to Civilian Needs, Washington, D.C., U.S. Government Printing Office, 1964; also, special section on "Economics and Politics of Arms Reduction," Bulletin of the Atomic Scientist, April 1964.

very closely allied applications. The shift from Air Force ICBM's to NASA space boosters is relatively slight from both product development and marketing and distribution viewpoints. Attempts to penetrate commercial markets have generally resulted in insignificant sales volumes and nominal if not negative profits results.[7]

To a large measure any potential markets for the systems and civilian government product capabilities of defense companies remains quite embryonic. Initial exploratory product development by defense companies may demonstrate to the government and the public the potentials and hence the desirability of public financing in obtaining a civilian payoff from the tremendous national investment already made in defense technology.

Alternatively, initial financing by the government might well encourage more ambitious industrial efforts along these lines. Possibly one of the most critical decisions to be made by defense industry product managers within the next few years is whether to take what may appear to be the lower risk route of waiting for initial government sponsorship of these new markets or, alternatively, to take the initiative which, if successful, could conceivably establish some major new industries in the next several decades. Alphonse or Gaston? Or is it rather the Lady or the Tiger?

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7. M. L. Weidenbaum, "Adjusting to the Defense Cutback: Public Policy Toward Business," Quarterly Review of Economics and Business, Vol. 4, No. 1, Spring 1964, pp 7-14.